



# Research on Offshore Wind Energy in Germany

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## Offshore Wind R&D

In Germany, offshore wind energy has the highest potential for expansion in the field of renewable energies in the next 10-20 years. Therefore, research and development is of high interest in this sector. The Federal Ministry for the Environment, in charge for renewable energies in Germany, continues its extensive research programme and expands with respect to wind energy the funds for research activities.

Offshore wind energy deployment implies the highest challenges in technology, grid integration and environmental aspects and thus underlines the importance of enhanced support for research and development.

### Research on Platforms

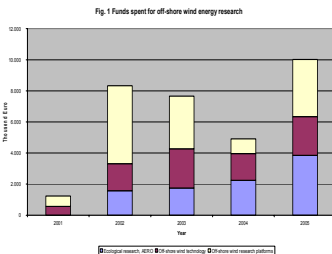
Research carried out on platforms in the North and Baltic seas is of high relevance and concerns environmental and nature-related research on wind energy deployment as well as fundamental technical research.

### International Cooperation

For the expansion of offshore wind energy use it is increasingly important to foster international cooperation in the field of research and development. The exchange of experiences and information about offshore wind energy deployment correlated aspects is of mutual interest and benefit. Examples:

- the cooperation in accompanying environmental research on wind energy deployment in the North and Baltic Seas between Denmark and Germany
- Germany rejoined the Implementing Agreement on "Wind Turbine Systems" of the International Energy Agency (IEA).

## Funds 2001-2005



## Offshore Wind R&D Highlights 2001-2005



**Enercon E 112**  
4.5 MW

Photo: ENERCON GmbH



**Multibrid M 5000**  
5 MW

Photo:  
Multibrid Entwicklungsgesellschaft  
mbH



### MINOS

Marine Mammals in the North  
and Baltic Seas

[www.minos-info.org](http://www.minos-info.org)



### FINO 1

Research Platform  
North Sea

[www.fino-offshore.com](http://www.fino-offshore.com)

Photo: Germanischer Lloyd  
WindEnergie GmbH

## R&D Programme Wind Energy

On the basis of the Energy Research Programme of the Federal Government a more detailed bulletin for research and development on the use of wind energy was announced by the Federal Ministry for the Environment in November 2004. Main goals are:

### 1. Reducing the costs and increasing the yield of electricity from wind energy

- by improving adjustment and monitoring technology,
- use of new materials,
- optimizing of off shore foundations,
- mass reduction of wind turbines (WT),
- reduction of mechanical loads on the WT structures and on foundations,
- upgrading the automation in the production process of WT and
- improvement of measuring and testing technologies.

### 2. Integration of big amounts of electrical energy produced from wind

- conceptions for grid integration of off shore wind farms,
- technologies for power management in the grid,
- improvement of yield prognosis,
- specific aspects of energy storage with respect to wind energy.

### 3. Accompanying ecological research to the off-shore wind energy deployment

- investigation of possible effects on marine mammals, birds, fishes and benthic organisms,
- cumulative effects from navigation, fishery, wind farms and exploration of mineral resources,
- development of technologies for the prevention or reduction of negative effects on the environment,
- networking of marine environmental data and information with respect to off shore wind energy.

### 4. Further topics of research are

- interactions with other technologies as wave energy deployment,
- research on measuring platforms in the North and Baltic Seas,
- further development of WT with low capacity for local applications.